

Message Text

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TAGS: ENRG, OECD
SUBJECT: NEA PUBLICATION - URANIUM RESOURCES PRODUC-
TION AND DEMAND

1. SUMMARY - NEA HAS PUBLISHED THE LATEST REVISION
OF ITS PERIODIC REPORT ON URANIUM RESOURCES AND
AND DEMAND. THE REPORT NOTES THAT CURRENT URANIUM
RESOURCES CORRESPOND TO ABOUT 19 YEARS FORWARD RE-
QUIREMENTS. WE HAVE RECENTLY NOTED INSTANCES WHERE
THIS FIGURE IS BEING ERRONEOUSLY CONSTRUED AS A FORE-
CAST OF A LOW LIMIT ON ULTIMATELY RECOVERABLE WORLD
URANIUM RESOURCES AND THEREFORE AS A CALL FOR EARLY
INTRODUCTION OF ADVANCED REACTOR SYSTEMS. WHEN ONE
CONSIDERS, HOWEVER, ALL THE INFORMATION PRESENTED
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IN THE PUBLICATION, THE HIGHLIGHTING OF DEFICIENCIES
IN CURRENT RESERVES CAN BE INTERPRETED MORE AS AN
APPEAL FOR THE VIGOROUS EXPLORATION AND DEVELOPMENT
OF ADDITIONAL RESOURCES NEEDED TO SUSTAIN REQUIRED
PRODUCTION RATES RATHER THAN AS A WARNING OF IMPEND-
ING SHORTAGES CREATED BY ULTIMATE RESOURCE LIMITS.
IN USING THE PUBLICATION AND RESPONDING TO INQUIRIES

MISSION BELIEVES WE SHOULD NOTE ABOVE AND EMPHASIZE THAT PUBLICATION WAS INTENDED AS A DESCRIPTION OF PRESENTLY KNOWN RELATIVELY LOW-COST RESERVES AND NOT AS A FORECAST OF THE TOTAL EXTENT AND AVAILABILITY OF WORLD URANIUM RESOURCES. END SUMMARY.

2. SINCE AUGUST 1965 THE NEA, IN CONJUNCTION WITH THE IAEA, HAS PERIODICALLY PUBLISHED A REPORT ON URANIUM RESOURCES AND DEMAND. THE LAST IN THE SERIES WAS PUBLISHED DECEMBER 1977. THE OPENING PARAGRAPH OF THE SUMMARY AND CONCLUSIONS SECTION OF THE LATEST REVISION NOTES THAT PRESENT URANIUM RESERVES OF 1.65 MILLION TONS, DEFINED AS REASONABLY ASSURED RESOURCES EXPLOITABLE AT A COST BELOW \$30 PER POUND OF U3O8, CORRESPONDS TO ABOUT 19 YEARS FORWARD REQUIREMENTS. THIS FIGURE ASSUMES PRESENT TREND NUCLEAR POWER GROWTH AND NO RECYCLE. FURTHER ON, IT IS INDICATED THAT UNDER THIS SET OF ASSUMPTIONS, CURRENT RESERVES MAY ONLY SUFFICE TO COVER THE LIFETIME REQUIREMENTS OF REACTORS IN-BEING UNTIL 1986-1988. IF SPENT FUELS WERE RECYCLED AT THE EARLIEST OPPORTUNITY, COVERAGE OF DEMAND BY RESERVES COULD BE EXTENDED BY ONLY ANOTHER 2 TO 3 YEARS.

3. THESE AND OTHER PROJECTIONS CONTAINED IN THE UNCLASSIFIED

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PUBLICATION CAN BE INTERPRETED AS CALLING FOR VERY EARLY INTRODUCTION OF ADVANCED REACTOR SYSTEMS. HOWEVER, THE AUTHORS OF THIS WELL WRITTEN AND CAREFULLY DOCUMENTED REPORT PLACE NUMEROUS CAVEATS AND RESERVATIONS ON THE INFORMATION PRESENTED. INDEED IT SEEMS THAT DATA, PARTICULARLY CONCERNING DEFICIENCIES IN KNOWN RESERVES AND RESOURCES, ARE PRESENTED AND HIGHLIGHTED MORE TO CALL FOR THE FURTHER EXPLORATION AND DEVELOPMENT NEEDED TO SUSTAIN REQUIRED PRODUCTION RATES RATHER THAN AS A WARNING OF FUTURE SHORTAGES CREATED BY ULTIMATE LIMITS ON THE URANIUM RESOURCE BASE. NEVERTHELESS, IN THE MONTH OR SO SINCE ITS PUBLICATION, THE MISSION HAS HAD TO RESPOND TO SEVERAL INTERPRETATIONS OF THE DATA AS A CALL FOR RAPID BREEDER REACTOR DEVELOPMENT BASED UPON RESOURCE LIMITATIONS. THE 19-YEAR FORWARD REQUIREMENT ESTIMATE, BECAUSE IT IS PRESENTED EARLY IN THE DOCUMENT IS THE MOST FREQUENTLY CITED FIGURE ON WHICH

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THIS INTERPRETATION IS BASED.

4. THE NEA/IAEA DOCUMENT WILL CERTAINLY BE VALID AS INPUT TO INFCE. FOR THIS REASON, MISSION BELIEVES IT MAY BE USEFUL TO PLACE THE CONCLUSIONS OF THE REPORT IN THEIR PROPER PERSPECTIVE. THE REPORT CAN BE INTERPRETED AND APPEARS INTENDED AS AN APPEAL FOR FURTHER EXPLORATION AND EARLY REMOVAL OF CONSTRAINTS ON INCREASED URANIUM PRODUCTION RATHER THAN AS NOTICE OF IMPENDING SHORTAGES BASED UPON DEPLETION OF LIMITED RESOURCES. WE CITE ONE GENERAL AND ONE SPECIFIC EXAMPLE TO SUPPORT THIS CONCLUSION -- BOTH DIRECTED TOWARDS PLACING THE 19-YEAR FORWARD ESTIMATE IN PERSPECTIVE.

5. TO BEGIN WITH, IT WOULD APPEAR SELF EVIDENT THAT GOVERNMENTS SUCH AS FRANCE, SPAIN, IRAN, TO CITE ONLY A FEW, WOULD NOT BE ORDERING AND PLANNING NUCLEAR POWER STATIONS FOR DELIVERY IN THE POST-1988
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PERIOD IF URANIUM RESOURCES WERE INDEED LIMITED ONLY

TO LIFETIME REQUIREMENTS OF THOSE PLANTS EXISTING IN THE 1986-1988 TIME PERIOD. THESE INVESTORS MUST CERTAINLY ANTICIPATE ADDITIONS TO CURRENT LOW-COST, REASONABLY ASSURED RESERVES BOTH FROM TRANSFER FROM LESS CERTAIN OR MORE COSTLY CATEGORIES AND THROUGH NEW DISCOVERIES. THE INFORMATION PROVIDED IN THE REPORT ITSELF SUPPORTS THIS ASSESSMENT. ESTIMATES OF THE PROJECTED ATTAINABLE CAPACITIES FOR WORLD URANIUM PRODUCTION PROVIDED BY GOVERNMENTS BUT BASED UPON INDUSTRY PROJECTIONS ARE GIVEN UNTIL 1990. ESTIMATED WORLD PRODUCTION IS SHOWN TO INCREASE ANNUALLY. IF ONE ASSUMES A CONVENTIONAL BELL SHAPED PRODUCTION CURVE WITH PEAK PRODUCTION OCCURRING IN 1990, IT CAN BE CALCULATED THAT THESE PRODUCTION PROJECTIONS HAVE BEEN BASED UPON RESOURCES IN EXCESS OF 2 MILLION TONS. IF, HOWEVER, WE ASSUME PEAK PRODUCTION AT A LATER DATE, SIGNIFICANTLY LARGER RESOURCE BASES ARE OBTAINED (3-4 MILLION TONS IF THE YEAR 2000 IS EMPLOYED). PEAK PRODUCTION AFTER THE TURN OF THE CENTURY CAN BE ASSUMED AS LIKELY, JUDGING BY THE TRENDS OF U.S. AND AUSTRALIAN ATTAINABLE PRODUCTION LEVELS WHICH ACCOUNT FOR MORE THAN HALF THE TOTAL AND WHICH ARE SHOWN TO INCREASE BETWEEN 5 AND 15 PERCENT EACH YEAR UNTIL 1990, THE LAST YEAR FOR WHICH INFORMATION IS PROVIDED. THUS WE FEEL THAT WHILE THE 19-YEAR ESTIMATE BASED UPON PRESENT LOW-COST RESERVES OF 1.65 MILLION TONS IS FACTUAL, A CLEAR PRESUMPTION CAN BE SHOWN TO EXIST AS TO THE FUTURE AVAILABILITY AND USE OF THE MORE ABUNDANT RESOURCES IN THE LESS ASSURED AND MORE COSTLY CATEGORIES.

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6. THE AUTHORS OF THE PUBLICATION IDENTIFY A TOTAL OF 4.4 MILLION TONS OF REASONABLY ASSURED AND ESTIMATED ADDITIONAL URANIUM RESOURCES IN THE COST CATEGORY BELOW \$50 PER POUND OF U3O8. GIVEN THE PROPER INCENTIVE, IT IS PROBABLE THAT INDUSTRY WOULD BE ABLE

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TO USE A LARGE PORTION OF THESE RESOURCES AND ADDITIONAL MATERIAL WHICH WILL UNDOUBTEDLY BE DISCOVERED TO INCREASE PRODUCTION CAPACITY TO MEET DEMAND AT LEAST INTO THE FIRST DECADE OR SO OF THE TWENTY-FIRST CENTURY. HIGH FOSSIL FUEL PRICES AND THE RELATIVE INSENSITIVITY OF NUCLEAR ELECTRICITY COSTS TO YELLOWCAKE PRICES CAN EVEN BE EXPECTED TO MAKE THE LONG-TERM USE OF HIGHER COST URANIUM OF ECONOMIC INTEREST. A QUANTITATIVE ASSESSMENT OF RESERVES IN THE COST CATEGORY RANGE OF \$50 TO \$100 PER POUND WAS NOT MADE DUE TO EXISTING UNCERTAINTY ABOUT THE EXTENT OF THESE RESOURCES. THE ABILITY OF THIS MORE THAN LIKELY VERY ABUNDANT MATERIAL TO ADEQUATELY SUPPORT LONG TERM DEMAND REQUIREMENTS MUST BE DETERMINED. HOWEVER, WE NOTE THAT THE REPORT INDICATES THAT EVEN OPTIMISTIC ESTIMATES OF EVENTUALLY RECOVERABLE WORLD URANIUM RESOURCES (SAY, SEVERAL TENS OF MILLIONS OF TONS) COULD BE CONSUMED BY THE MIDDLE OF THE TWENTY-FIRST CENTURY BY AN LWR-BASED INDUSTRY.

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THESE ISSUES ARE DISCUSSED IN THE REPORT BUT NEED CLARIFICATION, ELABORATION AND EMPHASIS.

7. IN SUMMARY, THE NEA PUBLICATION WAS NOT INTENDED TO FORECAST THE TOTAL EXTENT AND AVAILABILITY OF WORLD URANIUM RESOURCES. IT SIMPLY BRINGS KNOWN RESOURCES AND PRODUCTION ESTIMATES UP-TO-DATE AND COMPARES THE AMOUNT OF KNOWN LOW-COST RESERVES WITH PROJECTIONS

OF URANIUM DEMAND. THE COMPARISON OF THESE PRESENTLY
KNOWN RESERVES WITH FUTURE REQUIREMENTS IS NOT A
CORRECT BASIS FOR DETERMINING THE NEED FOR ADVANCED
REACTOR SYSTEMS. THE NEED FOR THESE SYSTEMS CAN
ONLY BE DETERMINED BY LONG-RANGE RESOURCE PROJECTIONS.
THE QUESTION OF WHETHER ULTIMATE RESERVE LEVELS WILL
BE SUFFICIENT TO SUSTAIN LONG-TERM NUCLEAR POWER
REQUIREMENTS CANNOT BE ANSWERED WITH THE INFORMATION
PROVIDED.

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